

## REMARKS

### Claim Status

Claims 1-12 and 14-29 remain pending in the present application. Claims 1, 5, 6, 10-11, 14-17, 20-22 and 28-29 have been amended in an editorial fashion. These amendments are made without prejudice and without surrender of any equivalent arrangements. For example, in claim 1, the phrase “the steps of” has been removed and “digitally” has been changed to --digital--. We have also broadened the scope of claim 20 by, e.g., replacing the word “modulating” with --changing--. Claim 12 has been amended to include the features of now canceled claim 13. We still expect to cover broad equivalents of “screening” and “hidden data” as recited in amended claim 12.

Claim 23 has been amended to direct its scope to an alternative aspect of the invention. We envision that amended claim 23 will cover a broad range of equivalents for this alternative aspect.

### Specification

The specification has been amended to include issued patent numbers.

### Art-based Rejection

Claims 1-29 stand rejected as being anticipated by U.S. Patent No. 5,946,414 (Cass). We respectfully traverse these rejections.

### ***Claim 1***

Claim 1 recites a method of digital watermarking a spot color. The method includes providing a first multicolor approximation of a spot color; based at least in part on the first multicolor approximation, providing multicolor components including a digital watermark signal; and combining a percentage of the spot color with the multicolor components.

By way of background only, a “*spot color*” refers, e.g., to a method of specifying or printing colors in which each color is printed or represented by its own ink. In

contrast, “*process color*” printing uses three (cyan, magenta and yellow) or four (cyan, magenta, yellow, and black) inks to produce all other colors within the CMY or CMYK color gamut. Spot colors sometimes lie outside the CMY or CMYK gamut.

Watermarking spot colors is tricky. Color shifting (as suggested by Cass) appears not to be a good alternative for spot colors since, after color shifting, a different spot color may be needed altogether.

Moreover, Cass is not understood to teach or suggest the combination recited in claim 1. For example, while Cass may provide multicolor components including a digital watermark signal (e.g., see FIGS. 8-10), these watermarked multicolor components are not then combined with a percentage of the spot color. Please consider the following.

The Office cites Cass at Col. 17, line 18 as teaching that  $\pm\delta$  is a percentage amount of a “spot color”. We respectfully disagree.

The Office seems to suggest that a Carrier Image, I, corresponds with a spot color and upsampled Carrier Image I', corresponds with a first multicolor approximation. (See, e.g., the Office Action on page 2, referring to: “the first multicolor approximation is to assign approximate color values to these two regions, c1 and c2, after upsampling operation 310.”)

If this is the case (which we do not concede, but discuss for argument’s sake), then the  $\pm\delta$  changes are added to the “multicolor components” and not to the spot color.

Cass at Col. 17, line 18 (cited in paragraph 1 of the office action) when read in context of its paragraph, confirms that the  $\pm\delta$  is added to the “upsampled carrier image” (see lines 10-12 and lines 16-17). Recall that upsampled Carrier Image I' corresponds (according to the Office’s argument) to Claim’s 1 multicolor approximation or multicolor components.

Thus, while Cass may provide multicolor components including a digital watermark signal (e.g., see FIGS. 8-10), these watermarked multicolor components are not then combined with a percentage of the spot color.

We respectfully request that claim 1 be allowed.

***Claim 20***

Claim 20 recites a method of digital watermarking an image including a spot color. The method includes approximating the spot color with cyan, magenta and yellow components; changing the cyan, magenta and yellow components to include a digital watermark; combining the changed cyan, magenta and yellow components with a scaled spot color component; and applying the combined components to a medium.

Cass fails to suggest approximating a spot color with cyan, magenta and yellow components and then combining changed cyan, magenta and yellow components with a scaled spot color component. As discussed above, Cass would apply color shifts  $\pm\delta$  to either Carrier Image I' (if upsampled) or to an original Carrier Image I (if not upsampled) – providing, at best, changed color components. But Cass does not then suggest that these changed color components should be combined with a scaled spot color.

We respectfully request that claim 20 be allowed.

***Claim 12***

Claim 12 recites a digital watermarking method comprising screening a spot color and combining the screened spot color with multicolor components. The multicolor components include at least cyan, magenta, and yellow, and the multicolor components include hidden data.

Cass is cited at Fig. 6 as teaching the combination recited in claim 12. We respectfully disagree.

In Cass, if the c1 color represents a “screened spot color,” then citing the color shifts  $\pm\delta$  alone can not cover both i) cyan, magenta and yellow multicolor components with hidden data, and ii) combining such multicolor components with the screened spot color.

We respectfully request that claim 12 be allowed.

***Claim 19***

Claim 19 recites a paper product including an image printed thereon. The printed image includes a combination having a halftone-screening of a spot color ink, and at least cyan, magenta and yellow inks, wherein the cyan, magenta and yellow inks include a digital watermark signal.

Cass is not understood to teach a halftone-screening of a spot color ink printed on a paper product. A key word search of the Cass patent failed to find any mention of spot color inks. Moreover, while Cass may discuss process colors (cyan, magenta and yellow), it does not suggest printing including a halftone-screening of a spot color ink and cyan, magenta and yellow inks, where the cyan, magenta and yellow inks include a digital watermark signal therein.

We respectfully request that claim 19 be allowed.

***Claim 23***

Claim 23 recites a method of embedding a spot color area. The method includes screening the spot color area to a percentage of its original intensity; and modulating of a set of pixels within the spot color area to comprise a watermark signal. The screened spot color area varies in intensity or luminance, and said modulating adapts modulation of the watermark signal according to localized areas of intensity or luminance resulting in the watermark signal varying across the spot color area. The spot color area is applied to a medium.

Cass is not understood to teach or suggest the modulation of claim 23, nor the resulting combination.

Favorable consideration is respectfully requested.

***Dependent Claims***

The dependent claims are also believed to recite patentable combinations. Favorable and independent consideration is respectfully requested.

Information Disclosure Statement

Applicants filed an Information Disclosure Statement and Form 1449 (collectively "IDS") on March 25, 2004. To date, we have not received initialed copies of the IDS. We are attaching herewith a copy of those papers, including our stamped-postcard receipt, for the Examiner's Convenience. Copies of the non-U.S. published patent documents can be provided again if needed. (We note that cited U.S. Patent Application No. 10/074,677 has issued as U.S. Patent No. 6,763,124 and cited U.S. Published Application No. US 2002-0164051 A1 has issued as U.S. Patent No. 6,804,377.)

Favorable consideration of our previously filed IDS is respectfully requested.

Conclusion

The present application is believed to be in condition for allowance. Nevertheless, the Examiner is invited to telephone the undersigned at 503-469-4685 if any issue remains.

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Respectfully submitted,

DIGIMARC CORPORATION

By



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Receipt is hereby acknowledged by the U.S. Patent and Trademark Office of the following: Information Disclosure Statement, Form PTO-1449, indicated references, and deposit account authorization

1/4  
Inventor: Brunk et al.  
Appn No. 09/963,344  
Filed September 25, 2001  
Digimarc Corporation

SWS:dks P0351  
March 25, 2004



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Brunk et al.

Serial No.: 09/963,344

Filed: September 25, 2001

Examiner: A. Johns

For: EMBEDDING DIGITAL WATERMARKS  
IN SPOT COLORS

Date: March 25, 2004

Art Unit 2621



**CERTIFICATE OF MAILING**

I hereby certify that this paper and the documents referred to as being attached or enclosed herewith are being deposited with the United States Postal Service on March 25, 2004, as First Class Mail in an envelope addressed to: COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450.

A handwritten signature of Steven W. Stewart in black ink.

Steven W. Stewart  
Attorney for Applicant

**INFORMATION DISCLOSURE STATEMENT**

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COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, VA 22313-1450

Applicants submit herewith information of which they are aware, and which they believe may be material to the examination of the application and in respect of which there may be a duty to disclose in accordance with 37 C.F.R. § 1.56. The information is listed on the attached Form PTO-1449. Copies of foreign patent documents and other documents are enclosed.

The submission of information on the attached Form PTO-1449 is not intended as an admission that any such information constitutes prior art against the claims of the application under examination. Applicants do not waive any right to take any appropriate action to antedate or otherwise remove any information from the attached Form PTO-1449.

No fee is required since this document is being submitted prior to the date of a first Office action.

If a first Office action on the merits was mailed prior to the mailing of this Information Disclosure Statement, please charge to Deposit Account No. 50-1071 any fees that may be required for considering this Information Disclosure Statement under 37 C.F.R. § 1.17(p).

Date: March 25, 2004

Respectfully submitted,

DIGIMARC CORPORATION

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<b>INFORMATION DISCLOSURE STATEMENT</b>	Docket: P0351	Ser. No. 09/963,344
	Applicant: Brunk et al.	
	Filed: September 25, 2001	Group: 2621

FEB 15 2005

## US Patent Documents

Ex'r Initial	Number	Date	Inventor	Class
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Examiner Signature:

Date Considered:

\*Examiner: Initial if considered, whether or not in conformance with MPEP 609; draw line through cite if not in conformance and not considered. Include copy of this form with next communication to applicant.



<b>INFORMATION DISCLOSURE STATEMENT</b>	Docket: P0351	Ser. No. 09/963,344
	Applicant: Brunk et al.	
	Filed: September 25, 2001	Group: 2621

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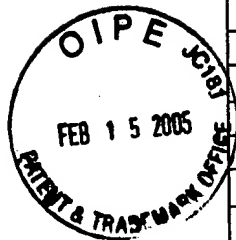
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	Berghel et al., "Protecting Ownership Rights Through Digital Watermarking," Computer, pp. 101-103, July 1996.
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Examiner Signature:

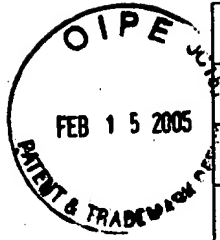
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	ORuanaidh et al, "Watermarking Digital Images for Copyright Protection," August, 1996, IEEE Proceedings-Vision, Image and Signal Processing, vol. 143, no. 4, pp. 250-6
	Reed et al, "Adaptive Color Watermarking," Proc. SPIE, Vol. 4675, pp. 222-229, 8 pages, January 21, 2002.
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	Vidal, "Non-Noticeable Information Embedding in Color Images: Marking and Detection," 1999 IEEE, pp. 293-297.

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